REMARKS

I. INTRODUCTION

Applicants hereby respectfully request reconsideration of the application in light of the amendments made and arguments to appear hereinafter.

II. OBJECTION TO THE DISCLOSURE

The disclosure of the present application was objected to because it referred to claim 1 for completeness. Applicants respectfully submit that this objection has been overcome by appropriate amendment made to the specification. Applicants respectfully request that the objection be withdrawn.

III. REJECTION OF CLAIMS 1, 9 AND 35 UNDER 35 U.S.C. § 112

Claims 1, 9 and 35 stand rejected under 35 U.S.C. § 112 as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In particular, the Office contends that the original disclosure does not provide support for a "magnetically permeable" electric field confining covering surrounding the conductor. The Office likewise contends that there is no support in the specification for the layers being in "intimate contact" or that the inner semi-conducting layer surrounding the conductor is in "electrical contact" therewith. With respect to the layers being in "intimate contact," Applicants respectfully amend the applicable claims as set forth above. However, with respect to the "magnetically permeable" electric field confining covering surrounding the conductor, Applicants respectfully submit that the rejection is improper.

Applicants submit, based on Nelson v. Bowler et al., 1 USPQ2d 2076, 2078 (Bd. Pat. App. & Int. 1986), that the claimed invention does not need to be described in *ipsis verbis* to be sufficient under the written description requirement. Accordingly, Applicants submit that the subject matter was inherently disclosed in the original disclosure, thereby satisfying the written description requirement.

The disclosure in the present invention recites a high voltage electric machine, such as a generator, comprising at least one "winding." (page 1, lines 1-6). These machines are used in power stations to produce electric power for distribution into power networks. (page 1, lines 28-35). The windings of these machines are constructed in such a way that the voltage produced by the machines can be increased to levels high enough to allow the machine to be directly connected to any power network without the use of an intermediate transformer. (page 2, lines 5-12). Under Faraday's law of induction, this power production can only occur if a magnetic field passes through a winding to induce current in the winding. Applicants submit that it is inherent, based on Faraday's law, that the winding must be magnetically permeable, otherwise the magnetic field could not pass through the winding, and therefore, no current would be produced in the winding, which would essentially invalidate Faraday's law. The present invention employs Faraday's principles, as do all generators, and the inherent knowledge in the art, in that the stator winding remains stationary as the rotor rotates, passing the magnetic field through the stator winding thereby setting up a current in the stator winding.

The disclosure also recites that an important advantage of the machine is that the electric field is nearly zero in the end region of the windings outside the second semi-conducting layer, therefore, no electric field needs to be controlled outside the end winding, and no field concentrations can develop. (page 5, lines 7-14). It is inherent within the cited language that the cable, more particularly the insulating covering, confines the electric field within itself, otherwise the electric field would <u>not</u> be near zero outside the outer semiconductor layer.

Because the original specification inherently disclosed that the winding is both magnetically permeable and electric field confining, Applicants respectfully submit that this rejection has been overcome. Accordingly, Applicants hereby respectfully request that the rejection be reconsidered and withdrawn, and the specification be amended, as set forth above, to clarify the inherent disclosure. The amendments are those of form and Applicants submit that no narrowing of the scope interpretation of any of the claims is intended or has occurred thereby in light of the specification as amended in this response.

IV. REJECTION OF CLAIMS 1-6, 8, 9, 11-13, 15, 16, 18, 19, 21, 22, 25-27, 29-35 AND 39-47 UNDER 35 U.S.C. § 103

Claims 1-6, 8, 9, 11-13, 15, 16, 18, 19, 21, 22, 25-27, 29-35 and 39-47 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Shildneck (U.S. Patent No. 3,014,139) in view of Elton et al. (U.S. Patent No. 5,036,165; "Elton ('165)"). The Office contends that it would have been obvious to have used the cable winding as taught by Elton ('165) to the dynamoelectric machine of Shildneck since such a modification according to Elton ('165) would prohibit the development of corona discharge. The Office also states that Elton ('165) teach having a semiconducting layer that bleeds off any static electric discharge or electric discharge developed on the exterior surface of the insulation. Further, the Office contends that it would be obvious to have formed the semiconducting layer with the same coefficient of thermal expansion as that of the insulation layer since it was known in the art that the expansion rate of the two layers would be the same and this is desirable in order to prevent cracking of the insulation and wear between the two. Applicants respectfully traverse this rejection for at least the reason that there is no motivation or incentive to combine the cited references. However, as a preliminary matter, a brief interpretation of the Elton ('165) reference is required.

INTERPRETATION OF ELTON ET AL. (U.S. PATENT 5,036,165)

Applicants understand the Office Action to mean that the Examiner is reading Elton ('165) as disclosing a particular type of electrical cable used as a winding in a dynamoelectric machine. For the reasons to appear hereinafter, Elton ('165) does not disclose that the electrical cable shown in Figure 1 thereof may be used for windings in a dynamoelectric machine. Rather, the conductor shown in Figure 1 of Elton ('165) is used only for an electrical transmission and distribution cable.

Elton ('165) is a divisional of what is now issued U.S. Patent No. 4,853,565 (Elton ('565)). As stated in column 1, lines 5-9 of Elton ('165), the '565 patent is incorporated by reference in its entirety into Elton ('165).

Therefore, although not reproduced expressly in Elton ('165), the Elton ('165) patent must be construed as if all of the text and drawings in Elton ('565) were expressly included in and reproduced in Elton ('165).

Applicants contend Elton ('565) teach mutually exclusive embodiments (*i.e.*, a "cable," a "bar," or "windings" in a generator). When the appropriate teaching from Elton ('565) is considered, one of ordinary skill would not see an incentive to combine it with Shildneck. Elton ('565) disclose, generally, the semiconducting layer for insulated electrical conductors in three different embodiments, none of which are a cable winding. The first embodiment (Figs. 1-6) deals with windings in a dynamoelectric machine. In this embodiment, the conductors are referred to exclusively as "windings" or "bars." The second embodiment (Fig. 7) relates strictly to an electrical cable 100 used for the transmission of high voltage. Within this embodiment, the conductor is referred to as a "cable" and not as a "bar" or "winding." The third embodiment (Fig. 8) relates to the use of a semiconductor layer disposed on an electrical housing surrounding digital electrical equipment. The conductor in this particular embodiment is referred to as a "housing" as opposed to a "cable," a "bar," or a "winding." In reviewing the Elton et al. references, the terms used were carefully chosen and applied uniformly throughout the references.

With the foregoing as background, it follows that the mention in Elton ('165) to a "dynamoelectric machine" was in all likelihood inadvertent (*i.e.*, that term, or sentences containing that term, were not deleted when the divisional was filed on the "cable" embodiment). In any event, however, why such mention to a "dynamoelectric machine" remains in the Elton ('165) patent is fairly immaterial, since, as described above, the entire contents of the Elton ('565) patent are incorporated by reference into the Elton ('165) patent. When all of the disclosure is taken together, as it must, it is clear that the conductor designated 100 in Elton ('165) relates only to an electrical cable for transmission and distribution of electrical power, and not to a winding for a dynamoelectric machine. Any other interpretation, Applicants submit, would be contrary to the plain meaning given to the words as defined in the Elton ('165) and Elton ('565) specifications.

NO MOTIVATION TO COMBINE

The Office has rejected the above claims as being obvious over Shildneck, in view of Elton ('165). Applicants submit that this is an improper combination of references in light of the standard regarding such a combination set forth in In Re Geiger, 815 F.2d at 688, 2 USPQ2d at 1278 (Fed. Cir. 1987). This standard is as follows: "[o]bviousness cannot be

established by combining the teachings of the prior art to produce the claimed invention, *absent some teaching, suggestion or incentive* supporting the combination." Id. (emphasis added).

Shildneck is an electric machine that possesses windings formed of cable. However, the machine in Shildneck is a high current/low voltage machine, and Applicants respectfully assert that Shildneck would not work in a high voltage application such as one the present invention operates within.

Shildneck describes a low-voltage, high-current machine with unconventional windings. As shown in Figs. 1-4 of Shildneck, the outermost layer of the winding (*i.e.*, element 8 in Figures 1-4) is made of an insulation material, as opposed to the semiconducting outer layer of the present invention. One object of Shildneck is to reduce the thickness required in the ground insulation (by providing a round conductor). If operated at high voltage, corona would develop in an ionized discharge path between the insulation material and the stator. The electric discharge from the insulation material to the stator would result in a deterioration of the insulation material, and would ultimately lead to a breakdown of the machine or the insulation levels would need to be much thicker, which goes against the object of the reference.

In machines operating at higher voltages, normally between 10 and 20 kV, sometimes up to 30 kV, the coil end is normally provided with an electric-field control in the form of so-called corona protection varnish intended to convert a radial electric field into an axial field, which means that the insulation on the coil ends occurs at a high potential relative to ground. The electric-field control evens out the dielectric stress of the insulating material in the end winding region, but electric field concentrations are still a severe problem in electrical machines operating at these higher voltages. Shildneck does not have any electric-field control, and such is not needed for machines, like Shildneck, operating at low voltages. Conventional insulation of conductors in electrical machines (such as so called mica-tape) is produced to some extent to provide resistance to partial discharge. If the ground insulation material as used by Shildneck (silicon rubber), were subjected to partial discharge, it would eventually lead to deterioration of the insulation material. Also, if Shildneck were operated at higher voltages, the uncontrolled electric field in the end winding region would also result in

high electric field concentrations causing a high dielectric stress of the insulation material, leading to deterioration of the insulation material.

The "invention" in Elton ('165) is the pyrolyzed glass fiber layer. Elton ('565) describes a process of immersing the winding portions in a bath of resin and vacuum pressure impregnating (VPI) the resin in the winding. The VPI process results in a cured resin having no voids or gaps between layers. The cable shown in Fig. 1 of Elton ('165) includes two pyrolyzed glass fiber layers, layers 104 and 110.

> The internal grading layer [104] is a semi-conducting pyrolyzed glass fiber layer as disclosed herein. . . . An insulation 106 surrounds internal grading layer 104. On the external surface of insulation 106, a semi-conducting pyrolyzed glass fiber layer 110 equalizes the electrical potential thereon.

(Elton ('165): column 2, lines 34-41).

The Elton '565 patent references Elton '077, which discusses Elton's process for making the pyrolized glass material. The method described in Elton yields the result of a stiff cable not capable of bending when cured. This is not surprising since the cable, a power cable, in Elton is for use in long, stretched out runs, where there are no bends therein. This is relevant because the cable shown in Elton cannot be manufactured in a coiled configuration for use in a stator, or in a storage device that requires coil windings that are formed with one turn on top of another. As described below, there is no way to make the cable of Elton in a bent or coiled configuration having a pyrolized outer layer without damaging the inner pyrolized layer. The pyrolized glass material needs to be cured. Once it is cured, the material becomes stiff. If bent after becoming stiff, the material cracks and develops voids, which would give rise to a cable failure if exposed to a high voltage stress. While it is possible to cure the outer layer of the cable after it is coiled, the insulation structure actually has an inner layer of semiconducting material as well. Consider that the pyrolyzed inner semiconducting layer cannot be cured after it has been encased with the insulation layer/outer pyrolized layer. Moreover, if the inner layer is cured before the insulation and outer layer are applied, then there is no way to later bend and form the Elton cable in a "compact" coiled configuration for use in a rotating electric machine, a power transformer or a compact magnetic energy storage module without cracks/voids, as described above. Consequently,

the outstanding Office Action has not presented a prima facie case of obviousness.

As further evidence that cable 100 shown in Fig. 1 of Elton ('165) would not be suitable as a winding in an electric machine, having two pyrolyzed glass fiber layers would cause the cable to be prohibitively stiff and not suitable for threading the winding through the stator slots. It may be possible to VPI the entire stator in a large resin bath after it had been wound with a flexible cable. However, such a process would not be feasible to produce both the internal grading layer 104 and the external layer 110 since an insulation layer 106 surrounds the internal grading layer 104 and both layers 110 and 104 would need to be exposed to the resin. Accordingly, while Elton et al. ('565) describes how to provide a pyrolyzed glass fiber layer for a bar-type winding, neither Elton ('565) nor Elton ('165) teach or suggest that cable 100 of Fig. 1 in Elton ('165) or Fig. 7 in Elton ('565) could be used for such a purpose, especially since cable 100 in the Elton et al. references would be stiff when cured, not flexible as the Office contends.

Elton ('565) recognize that in the end-winding region just outside of the stator of an electric machine, there will be problems caused by strong electric fields. As a solution, Elton ('565) describes using a known grading near the stator to allow some of the accumulated charge to bleed off to the stator, thus reducing the risk of arcing, but Elton ('565) offers no other solutions to the problems in the end-winding region. The strong electric fields will be present throughout the end-winding region, not just near the stator. The grading used in Elton ('565) will help to lessen the effects of the strong electric fields near the stator, but will not address the problems in the end-winding region away from the stator, further evidence that Elton is describing a conventional bar-type winding. Elton ('565) uses formed, rigid bar-type windings which are able to withstand mechanical stresses caused by induced fields between the windings in the end-winding region, where electromagnetic fields are not contained in the winding. The mechanical rigidity of the bar-type windings suppress the amount of vibration in the end-winding region that would otherwise be present. The fact that a grading system is used to lessen the end-winding region problems near the stator in Elton ('565) is further evidence that neither Elton ('565) nor Elton ('165) suggest using cable 100 winding of a machine, since such a cable would not have a grading.

The present invention specifically embodies a flexible cable winding and cable structure. The cable allows for a continuous full turn, making a joint in the end winding

unnecessary. This, along with the fact that the outer surface of the cable is grounded, allows for the confinement of the electric field resulting in the diminished risks of losses and damage in the end winding region. Elton ('165) may teach a cable, however, in no way does it teach the cable as a winding.

Moreover, there is no likelihood of success. The MPEP § 706.02(j) sets forth the burden that the Office must carry in order to reject claims based on obviousness. One criteria that must be met is that there must be a reasonable expectation of success. This criteria cannot be met when the aforementioned references are combined.

Assuming for the sake of argument that the cable 100 recited in Elton ('165) is combined with the cable windings of Shildneck, there is no likelihood of success because of the inflexibility and brittleness of cable 100. The pyrolyzed glass layer of cable 100 would crack when attempted to be wound around a core or threaded through the slots and bent in the end winding region to thread into the next stator slot. These cracks would, in effect, promote corona discharge as opposed to prohibit it, as is contended by the Office, resulting in losses attributed to the lack of confinement of the electric field, rendering the system inefficient. It is, therefore, not surprising that neither Elton ('565) nor Elton ('165) make any disclosure of the use of cable 100 as a "winding" in a dynamoelectric machine.

Accordingly, for at least the reasons set forth above, Applicants respectfully request that the rejection of claims 1-6, 8, 9, 11-13, 15, 16, 18, 19, 21, 22, 25-27, 29-35 and 39-47 be reconsidered and withdrawn. Applicants further submit, as an alternate ground of allowability, that claims 2-6, 8, 11-13, 15, 16, 18, 19, 21, 22, 25-27, 29-34 and 39-47 depend from base claims 1, 9 and 35 (believed allowable), and therefore, include every limitation of the respective base claim. Inasmuch as base claims 1, 9 and 35 are believed to be allowable, Applicants respectfully submit that the respective dependent claims of each base claim are also allowable for at least the same reasons pertaining to the allowability of the base claims. Accordingly, Applicants respectfully request that the rejection of the dependent claims be reconsidered and withdrawn in view of the believed allowability of base claims 1,9 and 35.

V. REJECTION OF CLAIMS 12, 13, 15, 16, 18, 19, 21, 22 AND 26-28 UNDER 35 U.S.C. § 103

The grounding methodologies of claims 12, 13, 15, 16, 18, 19, 21, 22 and 26-28 stand

rejected under 35 U.S.C. § 103 as being an obvious matter of design choice. The Office states that examples of commonly known grounding techniques are described in IEEE C62.92-1989, IEEE Guide for the Application Of Neutral Grounding in Electrical Systems, Part II. (IEEE, New York, USA, September 1989). Applicants respectfully traverse this rejection for at least the following reasons.

Applicants respectfully submit that the rejected claims depend from base claim 1 (believed allowable), and therefore, include every limitation thereof. Accordingly, for at least the same reasons that base claim 1 is believed to be allowable, the dependent claims are likewise believed to be allowable. Applicants, therefore, respectfully request that the rejection of these claims be reconsidered and withdrawn.

VI. <u>REJECTION OF CLAIM 7 UNDER 35 U.S.C. § 103</u>

Claim 7 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Shildneck (U.S. Patent No. 3,014,139) in view of Elton et al. (U.S. Patent No. 5,036,165; "Elton ('165)"), and further in view of Takaoka et al. (U.S. Patent No. 5,094,703). The Office contends that it would have been obvious to have used the windings of Elton ('165) comprised of insulated and uninsulated electrical conductor strands as taught by Takaoka et al. since such a modification according to Takaoka et al. would reduce the amount of insulation needed and the number of electrical connections required in the end windings. Applicants respectfully traverse this rejection for at least the following reasons.

Applicants respectfully submit that claim 7 depends from independent base claim 1 (believed allowable), and therefore, includes every limitation thereof. For at least the reasons set forth above pertaining to the allowability of claim 1, Applicants respectfully submit that dependent claim 7 is likewise believed to be allowable. Accordingly, reconsideration and withdrawal of the rejection of claim 10 is hereby respectfully requested.

As an additional basis of allowability, no motivation, incentive or suggestion exists to combine the Shildneck and Elton ('165) references, as is set forth above in Section IV. Because the base combination is improper, any broader combination is likewise improper, therefore, the broader combination of the Takaoka et al. reference is also improper.

Furthermore, Applicants respectfully assert that Takaoka et al. is simply a conventional device, which does not employ a high voltage cable as a winding. Takaoka et

al. may disclose a conductor having insulated and uninsulated strands, however, the purpose of this feature in Takaoka et al. is to reduce the "skin effect" associated with self induced currents in a transmission and distribution cable. Takaoka et al. has nothing to do with a cable winding where power is generated, much less reducing the phenomena known as eddy currents which develop when the cable is used as a winding in an electromagnetic device.

In the present invention, the insulated strands reduce eddy current losses by restricting the paths for such currents between the conductive strands. Eddy currents are induced in the winding as a result of the exposure of the winding to high magnetic fields in the rotating electric machine. These currents are problematic in these applications because they create electrical losses which are manifested as thermal energy (heat), which in turn causes a number of reliability problems in rotating machines. The device from the Takaoka et al. reference is not subjected to these problems associated with eddy currents because transmission and distribution cables are not subjected to the localized high magnetic field.

It is also necessary to employ at least one uninsulated strand in the instant invention to make contact with the semiconductive layer to set up an equipotential field, thereby confining the electric field within the winding and allowing for its use as a high voltage winding. In Takaoka et al., the outer strands are insulated because that is where the skin effect current flows. Accordingly, Takaoka et al. teach away from the invention (as claimed) because in the invention, the outer strand or strands are uninsulated for a different purpose. Therefore, in view of the foregoing, Applicants contend that one of ordinary skill in the art to which the invention pertains would not look to Takaoka et al.. Takaoka et al. do not disclose a cable as a winding, and the cable therein is not employed in high voltage applications. Accordingly, for at least the reasons set forth above, Applicants respectfully request that the rejection of the above claims be reconsidered and withdrawn.

VII. REJECTION OF CLAIMS 14, 17, 20, 23, 24 AND 28 UNDER 35 U.S.C. § 103

Claims 14, 17, 20, 23, 24 and 28 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Shildneck (U.S. Patent No. 3,014,139) in view of Elton et al. (U.S. Patent No. 5,036,165; "Elton ('165)"), and further in view of Lauw (U.S. Patent No. 4,982,147). The Office contends it would have been an obvious matter of design choice when operating in the voltage range of 30kV-36kV, to utilize a step-up transformer in order to increase and

Therefore, Applicants respectfully request that in light of the foregoing, the rejection of claims 14, 17, 20, 23, 24 and 28 be reconsidered and withdrawn.

meet the required voltage in the application. Applicants respectfully traverse this rejection for at least the following reasons.

Claims 14, 17, 20, 23, 24 and 28 are dependent on base claim 1 (believed allowable), and therefore, include every limitation thereof. Because base claim 1 is believed to be allowable, Applicants respectfully submit that for at least the same reasons pertaining to the allowability of claim 1, the above dependent claims are also allowable.

Additionally, the Office bases its rejection on the fact that Lauw teaches the use of transformers to step-up or step-down the voltage levels required for a given application. Applicants respectfully concede that Lauw may, in fact, disclose such use of transformers, however, the "applications" discussed in Lauw are variable speed drives for driving a pump, which is not disclosed as operating within the 30kV-36kV range. The Office has assumed, without support, that the principles of design choice that may apply at the voltage levels for the drive in Lauw, also apply in the 30-36kV range in the present application. In view of the fact that the 30kV-36kV range is approximately the voltage limit for conventional designs, and has been for 100 years, because of the breakdown point in air (discharge), such an assumption is improper.

Moreover, Applicants respectfully submit that one of the principle claimed features, or claimed advantages, of the present invention is the ability to provide power to high voltage power networks without the use of an intermediate transformer. The present application states "the machines can be directly connected to any power network without an intermediate transformer. Thus this transformer can be omitted." (p.2, lines 9-11). The present invention does include a transformer, however, it is not used to step-up the voltage to the power network, rather, as is discussed throughout the entire application, the transformers are used to carryout the grounding system of the machine. Therefore, the Office is incorrect in its assertion that the present invention utilizes transformers to step-up the voltage for distribution into a power network.

Accordingly, Applicants respectfully submit that the Office is correct in its assertion that it would have been obvious to one of ordinary skill in the art to utilize a step-up transformer in order to increase and meet the required voltage. However, it would not be obvious to connect the turbo-generator directly to the distribution network, as the present invention does.

VI. CONCLUSION

The foregoing represents a genuine effort to address and resolve all remaining issues. For the foregoing reasons, all presently pending claims are now believed to be in condition for allowance. Early notice of the same is hereby respectfully requested.

Respectfully submitted,

Date: November 30, 2001

By: ____________________

John W. Rees, Reg. No. 38,278
Dykema Gossett PLLC
39577 Woodward Avenue, Suite 300
Bloomfield Hills, MI 48304-5086
(248) 203-0832
jrees@dykema.com

John P. DeLuca, Reg. No. 25,505
Dykema Gossett PLLC
Franklin Square, Third Floor West
1300 I Street N.W.
Washington, DC 20005-3535
(202) 522-8626
jdeluca@dykema.com

::ODMA\PCDOCS\BH01\307362\1

EXHIBIT A

MARKED-UP COPIES OF AMENDED CLAIMS

1. (Four Times Amended) An electric high voltage AC machine for direct connection to a distribution or transmission network, said machine including at least one winding and having a neutral point and comprising at least one current-carrying conductor and a magnetically permeable, electric field confining covering surrounding [and being in electrical contact with] the conductor; a first layer having semi-conducting properties surrounding the conductor and being in electrical contact therewith, a solid insulating layer surrounding said first layer[and being in intimate contact therewith], and an outer layer having semi-conducting properties surrounding [and being in intimate contact with] said insulating layer, and grounding means for connecting the neutral point of said winding in circuit to ground.

9. (Four Times Amended) An electric AC machine having a magnetic circuit for high voltage comprising:

a magnetic core and at least one winding, wherein said winding is formed of a cable comprising at least one current-carrying conductor and a magnetically permeable, electric field confining covering surrounding the conductor, each conductor having a number of conductor elements, and inner semi-conducting layer surrounding the conductor and being in electrical contact with at least one of the conductor elements, an insulating layer of solid insulating material surrounding [said and being in intimate contact with] said inner semi-conducting layer, and an outer semi-conducting layer surrounding [and being in intimate contact with] said insulating layer, and grounding means for connection to at least one selected point of said winding to ground.

35. (Twice Amended) A high voltage electric machine comprising at least one winding, wherein said winding comprises a cable including at least one current-carrying conductor and a magnetically permeable, electric field confining cover surrounding the conductor including an inner semiconducting layer surrounding the conductor and being in electrical contact therewith, a solid insulating layer surrounding the inner layer [and being in intimate contact therewith], and an outer semiconducting layer surrounding the insulating layer [and being in intimate contact therewith], said inner and outer layers forming equipotential surfaces around the conductor, said cable forming at least one uninterrupted turn in the corresponding winding of said machine.

EXHIBIT B

MARKED-UP COPIES OF AMENDED SPECIFICATION PARAGRAPHS

This purpose is obtained with an electric high voltage AC machine of the kind defined in the introductory portion of the description and having the characterizing features of [claim 1] <u>at least one winding comprising at least one current-carrying conductor, and a magnetically permeable, electric field confining covering the conductor; a first layer having semi-conducting properties surrounding the conductor, a solid insulating layer surrounding said first layer, and an outer layer having semi-conducting properties surrounding said insulating layer, and grounding means for connecting the neutral point of said winding in circuit to ground</u>.

EXHIBIT C

CLEAN COPY OF PENDING CLAIMS

1. (Four Times Amended) An electric high voltage AC machine for direct connection to a distribution or transmission network, said machine including at least one winding and having a neutral point and comprising at least one current-carrying conductor and a magnetically permeable, electric field confining covering the conductor; a first layer having semi-conducting properties surrounding the conductor and being in electrical contact therewith, a solid insulating layer surrounding said first layer, and an outer layer having semi-conducting properties surrounding said insulating layer, and grounding means for connecting the neutral point of said winding in circuit to ground.

2. (Amended) The machine according to claim 1, wherein the potential of said first layer is substantially equal to the potential of the conductor.

3. (Amended) The machine according to claim 1, wherein the potential of said first layer is substantially equal to the potential of the conductor.

4. (Amended) The machine according to claim 3, wherein said second layer is connected to a predetermined potential.

5. (Amended) The machine according to claim 4, wherein said predetermined potential is ground potential.

6. (Amended) The machine according to claim 1, wherein at least two adjacent layers have substantially equal thermal expansion coefficients.

7. (Amended) The machine according to claim 1, wherein said current-carrying conductor comprises a number of strands, only a minority of said strands being non-isolated from each other.

8. (Twice Amended) The machine according to claim 1, wherein said layers are adjacent to each other, and each of said layers has at least one connecting surface each being fixedly connected to the connecting surface of the adjacent layer along substantially the whole of said connecting surface.

9. (Four Times Amended) An electric AC machine having a magnetic circuit for high voltage comprising:

a magnetic core and at least one winding, wherein said winding is formed of a cable comprising at least one current-carrying conductor and a magnetically permeable, electric field confining covering surrounding the conductor, each conductor having a number of conductor elements, and inner semi-conducting layer surrounding the conductor and being in electrical contact with at least one of the conductor elements, an insulating layer of solid insulating material surrounding said inner semi-conducting layer, and an outer semi-conducting layer surrounding said insulating layer, and grounding means for connection to at least one selected point of said winding to ground.

10. (Amended) The machine according to claim 9, wherein said cable also comprises a metal shield and a sheath.

11. (Amended) The machine according to claim 9, wherein said grounding means comprise means for direct grounding of the winding.

12. (Amended) The machine according to claim 1, wherein said grounding means comprise means for low-resistance grounding of the winding.

13. (Amended) The machine according to claim 12, said machine having a Y-connected winding neutral point and wherein said low-resistance grounding means comprise a low-resistance resistor connected between the neutral point and ground.

14. (Amended) The machine according to claim 12, said machine having a Y-connected winding the neutral point further comprising a transformer having a primary and a secondary winding and wherein said low-resistance grounding means comprises a resistor connected in the secondary of the transformer whose primary is connected between the neutral point and ground.

15. (Amended) The machine according to claim 1, wherein said grounding means comprise means for low-inductance grounding of the winding.

16. (Amended) The machine according to claim 15, said machine having a Y-connected winding the neutral point and wherein said low-inductance grounding means comprises a low-inductance inductor connected between the neutral point and ground.

17. (Amended) The machine according to claim 15, said machine having a Y-connected winding neutral point, further comprising a transformer having a primary and a secondary winding and wherein said low-inductance grounding means comprises an inductor connected in the secondary of the transformer whose primary is connected between the neutral point and ground.

18. (Amended) The machine according to claim 1, wherein said grounding means comprise means for high-resistance grounding of the winding.

19. (Amended) The machine according to claim 18, said machine having a Y-connected winding neutral point and wherein said high-resistance grounding means comprise a high-resistance resistor connected between the neutral point and ground.

20. (Amended) The machine according to claim 18, said machine having a Y-connected winding neutral point further comprising a transformer having a primary and a secondary winding and wherein and wherein said high-resistance grounding means comprise a resistor connected in the secondary of the transformer whose primary is connected between the neutral point and ground.

21. (Amended) The machine according to claim 1, wherein said grounding means comprise means for high-inductance grounding of the winding.

22. (Amended) The machine according to claim 21, said machine having a Y-connected winding the neutral point and wherein said high-inductance grounding means comprises a high-inductance inductor connected between the neutral point and ground.

23. (Amended) The machine according to claim 21, said machine having a Y-connected winding neutral point further comprising a transformer having a primary and a secondary winding and wherein said high-inductance grounding means comprises an inductor connected in the secondary of the transformer whose primary is connected between the neutral point and ground.

24. (Amended) The machine according to claim 1, said machine having a Y-connected winding neutral point , further comprising a transformer having a primary and a secondary winding and wherein said grounding means comprises a reactor connected in the secondary of the transformer whose primary is connected between the neutral point and ground, said reactor having characteristics such that capacitive current during a ground fault is substantially neutralized by an equal component of inductive current contributed for by the reactor.

25. (Amended) The machine according to claim 1, wherein said grounding means comprises means for changing the impedance of the connection to ground in response to a ground fault.

26. (Amended) The machine according to claim 1, wherein said grounding means comprises an active circuit.

27. (Amended) The machine according to claim 1, wherein said grounding means comprises a Y-Δ grounding transformer connected to the network side of the machine.

28. (Amended) The machine according to claim 1, wherein said grounding means comprise a zigzag grounding transformer connected to the network side of the machine.

29. (Amended) The machine according to claim 1, said machine having a Y-connected winding neutral point wherein said grounding means comprise a suppression filter tuned for the n:th harmonic.

30. (Amended) The machine according to claim 1, said machine having a Y-connected winding neutral point wherein said grounding means comprise a switchable suppression filter detuned for the n:th harmonic.

31. (Amended) The machine according to claim 29, wherein said n:th harmonic is the third harmonic.

32. (Amended) The machine according to claim 1, said machine having a Y-connected winding neutral point wherein said grounding means comprise an overvoltage protector connected between said neutral point and ground.

33. (Amended) The machine according to claim 1, said machine having a Y-connected winding neutral point wherein an overvoltage protector is connected between said neutral point and ground in parallel to said grounding means.

34. (Amended) A distribution or transmission network, which comprises at least one machine according to claim 1.

35. (Twice Amended) A high voltage electric machine comprising at least one winding, wherein said winding comprises a cable including at least one current-carrying conductor and a magnetically permeable, electric field confining cover surrounding the conductor including an inner semi-conducting layer surrounding the conductor and being in electrical contact therewith, a solid insulating layer surrounding the inner layer, and an outer semi-conducting layer surrounding the insulating layer, said inner and outer layers forming equipotential surfaces around the conductor, said cable forming at least one uninterrupted turn in the corresponding winding of said machine.

39. (Amended) The machine of claim 35, wherein the cover is formed of a plurality of layers including an insulating layer and wherein said plurality of layers are substantially void free.

40. (Amended) The machine of claim 35, wherein the cover is in electrical contact with the conductor.

41. The machine of claim 40, wherein the layers of the cover have substantially the same temperature coefficient of expansion.

42. (Amended) The machine of claim 35, wherein the cover is heat resistant such that the machine is operable at 100% overload for two hours.

43. (Amended) The machine of claim 35, wherein the machine, when energized, produces an electric field and the cover confines the electric field so that the cable is operable free of sensible end winding loss.

44. (Amended) The machine of claim 35, wherein the machine, when energized, produces an electric field and the cover confines the electric field so that the winding is operable free of partial discharge and field control.

45. The machine of claim 35, wherein the winding comprises multiple uninterrupted turns.

46. The machine of claim 35, wherein the cable comprises a transmission line.

47. The machine of claim 35, wherein the cable is flexible.